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EPA Region 5 Records Ctr.



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Region 5  
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Subject: WA No. 219-RSBD-B5Y7, Contract No. 68-W6-0025  
Eagle Zinc Site, Hillsboro, Illinois  
Comments on Responses to EPA Comments – Human Health and Screening Level  
Ecological Risk Assessment Approaches

Dear Dion:

As requested, we have reviewed ENVIRON's letter dated January 26, 2004, in which ENVIRON responds to EPA's comments on the proposed human health and ecological risk assessment approaches for the Eagle Zinc site. EPA's comments to ENVIRON were provided in a letter dated December 30, 2003, and ENVIRON's original submittal to EPA was sent on November 3, 2003.

In their January 26, 2004 letter, ENVIRON also responded to EPA's January 14, 2004 email notification that volatile organic compounds (VOCs) in the western drainageway had not been adequately delineated by the investigation that was completed in November 2003. This letter provides our comments on ENVIRON's response to the VOC issue.

## **Review of ENVIRON's Responses to Comments**

Based on our review of ENVIRON's January 26, 2004 letter, we have general concerns regarding the proposed screening-level ecological risk assessment (SLERA) approach. In addition, several of EPA's specific comments were not adequately addressed by ENVIRON's responses. Each specific comment is presented below, followed by our review of ENVIRON's response to the comment.

## **General Concerns on Proposed SLERA Approach**

We have two general concerns about the SLERA approach proposed by ENVIRON. First, ENVIRON should provide information to support the assumption that physical impacts are indistinguishable from chemical impacts. In addition, they should clearly document all physical impacts and, if possible, provide information to support the assumption that habitats are not functioning ecologically.

Our concern is that, regardless of the SLERA results, risks from chemical concentrations may be dismissed because they are indistinguishable from the impact of physical stressors. We agree that, if impacts cannot be distinguished from chemical impacts, further evaluation beyond a SLERA is not necessary, as stated in USEPA guidance. However, it is possible that these impacts can be separated at the site although the current data may not be sufficient in this regard. This information would include such things as the rates of sedimentation, a quantified level of impact on the benthic community, levels of sedimentation necessary to impact benthic communities, and the condition of benthic communities in other drainageways with site-related chemical impacts but without sedimentation. This does not represent a data gap for the SLERA because this information is typically collected, provided, and evaluated in a baseline ecological risk assessment (BERA).

It should be noted that the assessment endpoints provided (impacts "resulting from toxicity"; Page 8 of January 26, 2004 letter) also do not support an approach to separate physical and chemical impacts. If this cannot be provided, then risks from chemical impacts should not be dismissed based on physical impacts in the SLERA.

Our second general concern is related to terrestrial receptors. In the December 30, 2003 letter to ENVIRON, EPA recommended that these receptors be evaluated in the SLERA. This recommendation was based on indications that 1) a significant amount of terrestrial habitat exists on-site; 2) on-site impacts to terrestrial habitat exist; and 3) there is documented use by terrestrial ecological receptors. Although the level of use by terrestrial receptors is not clear (e.g., whether the receptors are just passing through the site or are permanent residents), the evaluation is a conservative assumption consistent with a SLERA approach, regardless of future conditions.

## **Specific Comment #5, Table 2**

### **EPA Comment:**

If the potential for dermal exposure to groundwater is small, then the exposure pathway is complete and should be evaluated, regardless of whether Environ considers the exposure to be negligible. There continue to be reports of area citizens using private wells in the site vicinity-without some sort of comprehensive survey, it cannot be stated with certainty that the aquifer is not a source of water for the area. Finally, EPA comments asked for the evaluation of off-site migration of dust from the residue piles as a part of the investigation.

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Modeling results or specific data must be presented to substantiate any preliminary conclusion here that dust has not migrated off site and no complete exposure pathway exists.

**Summary of ENVIRON's Response:**

In their response, ENVIRON agrees to evaluate dermal exposure in the human health risk assessment. However, regarding the private wells and off-site migration of dust from residue piles, ENVIRON cites May 2002 correspondence between EPA and ENVIRON and excerpts from the March 2003 Phase I Technical Memorandum. The following paragraph was included in their response to off-site migration of dust:

*"Concerning lead and cadmium, all concentrations of these metals detected in off-site soils during the 1993 ESI are below current USEPA risk-based soil screening levels for residential land use. ENVIRON cannot comment on the resident's questions concerning growing vegetables. These questions are best directed to the local health department."*

**CH2M HILL Response:**

CH2M HILL believes that the human health risk assessment can provide some value in addressing community concerns by including a fruit and vegetable ingestion pathway through gardening. We recommend that this ingestion pathway be included in the risk assessment.

**Summary of ENVIRON's Response (continued):**

Another paragraph from ENVIRON's response follows:

*"The Compilation of Air Pollutant Emission Factors, AP-42, Fifth Edition, Volume I: Stationary Point and Area Sources, in Section 13.2.4 states: As the aggregate pile weathers, however, potential for dust emissions is greatly reduced. In fact, the half-life of this erosion potential ranges between 1 and 4 minutes. Therefore, any air erosion of the piles would be limited to a very short time period immediately following emplacement and would not be expected to occur over a protracted period of time. In addition, any impacts resulting from air erosion of residue piles would be expected to be the greatest closest to the source. Since no on-site soil impacts in the Northern Area of investigation were identified in the Phase 1 investigation, and existing off-site data show no impacts, off-site air erosion of residue piles and subsequent deposition is not considered a viable contaminant transport pathway at the Eagle Zinc site."*

**CH2M HILL Response:**

If this assertion is correct, then modeling of particulate concentrations in air should produce relatively small contributions to total site risks. We recommend that an air pathway analysis and evaluation of potential inhalation exposures, and indirect exposures via deposition, associated with wind-blown dust, be included as part of the risk assessment. A limited-reservoir emissions model might be used in this analysis, if the conditions described in ENVIRON's response adequately reflect site conditions.

### **Specific Comment #13, Page 4, Paragraph 3**

#### **EPA Comment:**

The SLERA should provide a definition of the community-level of effects to be evaluated. A community- or population-level of assessment should be clearly defined, as this level of assessment may include an evaluation of site-specific assumptions, such as spatial evaluation or a refinement of contaminants of concern, which is not appropriate for a SLERA. Refining contaminants of concern by evaluating frequency and magnitude of detection, background concentrations, or dietary considerations should be reserved for a baseline ERA.

#### **ENVIRON Response:**

If we understand this comment correctly, it is saying that certain elements of a community level assessment are not appropriate in a SLERA. The above table in the response to comment #8 clarifies what assessment and management endpoints will be used. We would appreciate a clarification of this comment from USEPA.

We do not plan to evaluate the frequency and magnitude of detection, or background concentrations. Dietary considerations, however, are a part of the assessment of exposure parameters for wading birds and piscivorous mammals.

#### **CH2M HILL Response:**

The dietary considerations mentioned are those related to the refinement of COCs, such as nutrient levels or absorptive capacity, that are often evaluated in the baseline ERA to refine the list of COCs. Dietary composition should be part of the assessment of exposure, as indicated.

## **VOC Delineation in Western Drainageway**

In November 2003, ENVIRON collected surface water and sediment samples from the western drainageway to assess the nature and extent of VOCs in the drainageway channel. Analytical results from these samples indicated that VOC impacts extend at least as far as the most upstream sample, located roughly 400 feet from the drainageway's outlet into the southwest pond.

In an email dated January 14, 2004, EPA notified ENVIRON that the source of VOC impacts had not been defined and that VOC concentrations in the drainageway were of concern to the Agency. ENVIRON provided a response to EPA's email in their January 26, 2004 letter, stating that the VOC concentrations were a "negligible relict of the long industrial history of the site" and that VOC impacts in surface water are not migrating offsite. In addition, ENVIRON indicated that further investigation of the VOC impacts could be performed if current VOC results indicate an unacceptable risk to human health or the environment.

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CH2M HILL believes that risk assessments would reveal that VOC concentrations in the western drainageway do not pose an unacceptable human health or ecological risk, under current conditions as they are characterized by the existing data. However, we disagree with ENVIRON's suggestion to terminate further investigation of these VOC impacts solely on the basis of probable risk assessment conclusions. Persistent VOC concentrations in surface water, even at low concentrations, indicate a possible upgradient source area, such as non-aqueous phase liquid (NAPL) in groundwater or contaminated soil resulting from previous spills of chlorinated solvents.

To provide the assurance that the existing VOC concentrations in sediments and surface water represent long term conditions, and do not pose a human health or ecological risk, we recommend that ENVIRON collect additional upstream surface water and sediment samples from the western drainageway to delineate the upgradient extent of VOC impacts in the drainageway channel. To support the conclusion that VOC concentrations, and therefore potential risks, will not increase in the future, we recommend that surface water samples be collected from the drainageway on a semi-annual or quarterly basis until at least November 2004, using the November 2003 sampling event as the initial data set in the monitoring effort.

EPA may consider requesting additional subsurface soil and groundwater samples upgradient from the western drainageway. Such sampling may not reveal the source of VOCs in the drainageway, however, especially if the source area is small. In the event that a source area is not found, periodic sampling of the western drainageway will demonstrate whether VOC concentrations are actually decreasing over time, as ENVIRON states in their January 26, 2004 letter.

Human health and ecological risk assessments should be prepared now, rather than waiting for results from subsequent sampling at the site. If further investigation reveals elevated VOCs beyond the extent and concentrations already observed, the risk assessments can be modified later to include the supplemental data.

We hope that the comments and recommendations are helpful. Please call us if you have any questions regarding the attached document.

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Sincerely,

CH2M HILL



for

Chris English, P.E.  
Site Manager

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